

WHAT IS CLAIMED IS:

1. A mobile data communication system for a wireless data communication, comprising:

a plurality of mobile stations;

5 a plurality of base stations and base station controllers for transferring a signal transmitted from said mobile stations and a signal transmitted to said mobile stations in a predetermined service area;

mobile switching center for deciding service option  
10 included in the signal transmitted from the base stations and base station controllers and for executing a circuit data service or a packet data service according to the decided service option; and

at least one mobile data network interworking units for  
15 establishing a traffic channel of a mobile data path and a call between a calling party mobile station and a called party mobile station when said mobile switching center performs the circuit data service.

2. A mobile data communication system claimed in claim 1,  
20 wherein said mobile switching center comprises:

mobile connection control module for deciding a service option included in the signal transmitted from said base station

and base station controllers and for generating a switching signal controlling an interface connection;

mobile data path connection control module for controlling the connection to a mobile network data path according to the  
5 output signal of said mobile connection control module;

public network data path connection control module for controlling the connection to a public network data path according to the output signal of said mobile data network interworking unit; and

10 trunk connection control module for transmitting the output signal of said public network data path connection control module or said mobile network data path connection control module to the public switched telephone network or to the other mobile switching center according to the output signal  
15 of said mobile data path control module or said public network data path connection control module.

3. A mobile data communication system claimed in claim 1, wherein said mobile station includes a couple of a data terminal and a mobile terminal which are connected to each other or a  
20 separate mobile terminal

4. A mobile data communication system claimed in claim 3, wherein said data terminal includes one of notebook, personal

digital assistant, laptop, palmtop, portable or small computer.

5 5. A mobile data communication system claimed in claim 1, wherein each of said mobile stations includes a protocol stack for a circuit data and a call processing module for processing a packet data.

6. A mobile data communication system claimed in claim 1, wherein said mobile data network interworking unit includes:

10 a data path connection section for forming a path connection between said mobile switching center and mobile data network interworking unit;

a main processing section forming a traffic channel of a mobile data path between a calling party mobile station and a called party mobile station to execute a circuit data communication or a packet data communication according to a received signal from said data path connection section;

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a circuit data processing section analyzing the signal transmitted from said calling party mobile station if the protocol between the calling party mobile station and the called party mobile station is normally executed when said main processing section performs the circuit data service and then transmitting said called party identification number to said

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main processing section; and

a switching section selectively switching the connection between said circuit data processing section and said data path connection section according to the control signal of said main processing.

7. A mobile data communication system claimed in claim 5,  
wherein said main processing section includes:

a mobile data path control module for establishing a link with said mobile switching center;

10           a circuit data control module controlling the exchange of  
the traffic data information between said mobile station and  
circuit data processing section;

a modem control module controlling the modem equipped in said circuit data processing section; and

15        a public network data path control module for establishing  
the link with said mobile switching center.

8. A mobile data communication system claimed in claim 5,  
wherein said circuit data processing section includes:

an interface control section performing an interface  
20 between said main processing section and said circuit data  
processing section;

at least one modems; and

a modem controller controlling an operation of the modem according to a modem control signal of said interface control section.

9. A mobile data communication system claimed in claim 1,  
5 wherein said mobile data communication system is characterized by a CDMA mobile data communication system.

10. A wireless data communication method in which at least one mobile switching centers including a mobile connection control module, a mobile data path connection control module, a  
10 public network data path connection control module and a truck connection control module are connected with at least one data network interworking units by a first data path and a second data path, comprising the steps of:

inputting an identification number of a called party mobile  
15 station;

establishing a first call from a calling party mobile station to said mobile data network interworking unit and then establishing a first traffic channel;

calling a called party mobile station at said mobile data  
20 network interworking unit;

establishing a second call from said called party mobile station to said mobile data network interworking unit when a

data response comes from said called party mobile station and then establishing a second traffic channel after said mobile data path connection module informs said public network data path connection control module of the normal state of said first  
5 data path;

establishing a call between said mobile switching center and the mobile data network interworking unit through the second data path; and

connecting said first and second traffic channels through  
10 at least one modems.

11. A wireless data communication method claimed in claim 10, wherein said first data path is a mobile data path and said second data path is a public network data path.

12. A wireless data communication method claimed in claim  
15 10, wherein the identification number of said called party mobile station is inputted by an ATD command and the data response is automatically generated by a preset automatic response mode or an ATA command.

13. A wireless data communication method claimed in claim  
20 10, wherein said steps for establishing the first call includes the steps of:

deciding the service option included in the signal transmitted from said calling party mobile station; and

requesting said data network interworking unit to establish a call when said service option is to request a circuit data communication service.

14. A wireless data communication method claimed in claim 10, wherein said step of establishing the first traffic channel includes the steps of:

initializing a first modem equipped in said data network interworking unit;

connecting a path between said calling party mobile station and said data network interworking unit to modem;

establishing a communication protocol between said calling party mobile station and said data networking unit;

transmitting the identification number of said calling party mobile station and said modem initialization specification from said calling party mobile station to said first modem; and

reestablishing with a modem initialization specification required by said calling party mobile station.

15. A wireless data communication method claimed in claim 14, wherein said step of initializing the first modem includes

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the step of :

deciding whether or not there is an idle resource in the first modem; and

establishing a basic configuration value when there is an  
5 idle resource in the first modem.

16. A wireless data communication method claimed in claim 10, wherein said step of said called party mobile station includes the steps of:

transmitting a connection request message from said mobile  
10 data network interworking unit to said mobile switching center;

requesting an incoming connection from said mobile station to said called party mobile station; and calling a mobile terminal of said called party mobile station.

17. A wireless data communication method claimed in claim  
15 10, wherein the step of establishing said second call includes the steps of:

deciding a service option included in the signal transmitted from said called party mobile station; and

requesting said data network interworking unit to establish  
20 a call when a decision on said service option is for a circuit data communication service.

18. A wireless data communication method claimed in claim



10, wherein the step of establishing said second traffic channel includes the steps of:

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        initializing a second modem equipped in said data network
interworking unit;

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5       connecting a path between said called party mobile station  
and said data network interworking unit to modem;

establishing a communication protocol between said called party mobile station and said data network interworking unit;

transmitting said incoming response receive message and  
10 said modem initialization specification from said called party  
mobile station to said second modem; and

reestablishing a modem initialization specification  
required by said calling party mobile station.

19. A wireless data communication method claimed in claim 15 18, wherein the step of initializing the modem includes the steps of:

deciding whether or not there is an idle resource in said second modem; and

establishing a basic configuration value when there is an  
20 idle resource in said second modem.

20. A wireless data communication method claimed in claim 10, wherein the steps of establishing said first and second

calls and connecting the traffic channel comprise the steps of:

informing said public network data path connection control module by said mobile data path connection control module that said first data path is normally established;

5 establishing a call between the public network data path connection control module and the data network interworking unit through said second data path;

connecting a path of the first call with a path of the second call in the public network data path connection control  
10 module;

making the traffic channel between said mobile connection control module and said public network data path connection control module inactive;

receiving both a connection request message transmitted  
15 from said calling party mobile station through the mobile switching center and a incoming response message transmitted from said called party mobile station into said data network interworking unit;

connecting at least one modems equipped in said data  
20 network interworking unit which is assigned to link said connection request message and said incoming response message to each other; and

confirming the connection of said modems.

21. A wireless data communication method in which at least than one mobile switching centers having a mobile connection control module, a mobile data path connection control module, a public network data path connection control module and a trunk connection control module is connected with at least than one data network interworking units through a first data path and a second data path, comprising the steps of:

a) inputting an identification number of a called party mobile station;

b) establishing a first traffic channel after establishing a first call from a calling party mobile station to a first mobile data network interworking unit through a first mobile switching center;

c) calling a called party mobile station controlled by a second mobile switching center from said first mobile data network interworking unit through said public network data path connection control module and said trunk connection control module;

d) establishing a second traffic channel after a second call from said called party mobile station to a second mobile data network interworking unit is established when said called

party mobile station is responded and said mobile data path connection module informs said public network data path connection control module of a normal state of said first data path;

5 e) establishing a call between said public network data path connection control module and said second mobile data network interworking unit after said mobile data path connection control module informs said public network data path connection control module of the completion of channel establishment when  
10 said second traffic channel is completely established;

f) releasing the traffic channel between said mobile connection control module and said public network data path connection control module when the call establishment between the public network data path connection control module and said  
15 second mobile data network interworking unit is completed; and

g) connecting said public network data path connection control module with the trunk connection control module.